

CALCULATOR PRODUCTS DIVISION  
OPERATING STRATEGY REVIEW  
ADVANCED LANGUAGE CALCULATOR - MARKET RESEARCH STATUS

- 0 INTERVIEWS WERE COMPLETED LAST WEEK WITH 850 INTERVIEWS OUT OF A PLANNED 900. EVERY CATEGORY ACHIEVED MORE THAN 85% OF QUOTA EXCEPT FOR PRACTICING SCIENTISTS WHICH ACHIEVED 74%.
- 0 THREE CONCEPTS WERE PRESENTED:
  - ALPHANAMERIC KEYSTROKE PROGRAMMABLE SIMILAR TO TI-88.
  - ONE LINE BASIC PROGRAMMABLE WITH PLUG-IN SOFTWARE.
  - SIX LINE PROFESSIONAL PRODUCT WITH PLUG IN LANGUAGE (VISICALC, DATACOM, BASIC).
- 0 GOALS OF THE RESEARCH:
  - COMPARISON OF KEYSTROKE VERSUS BASIC PROGRAMMING BY TYPE OF USER AND BACKGROUND
  - ROUGH PRICE/VOLUME FOR EACH CONCEPT
  - FEATURE RANKING AND INPUTS FOR CONCEPT IMPROVEMENT
- 0 MCCANN ERICKSON WILL PRESENT THEIR REPORT ON SURVEY RESULTS ON JULY 8.

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CALCULATOR PRODUCTS DIVISION  
OPERATING STRATEGY REVIEW  
ADVANCED LANGUAGE CALCULATOR COMPETITIVE OUTLOOK

- 0 CASIO INTRODUCED FX-702P AT CES WHICH IS SIMILAR TO SHARP PC-1211 EXCEPT FOR FASTER SPEED, ADDITIONAL BUILT IN FUNCTIONS AND MORE STEPS (1680 VS 1424). THESE PRODUCTS DO NOT HAVE PLUG IN SOFTWARE OR MEMORY EXPANSION AND HAVE LIMITED I/O (CASSETTE AND PRINTER).
- 0 IT APPEARS THAT RADIO SHACK WILL REPLACE THE PC-1211 IN THE NEAR FUTURE WITH ANOTHER PRODUCT, PROBABLY OF HIGHER PERFORMANCE. PANASONIC/QUASAR SHOULD BE ON THE MARKET SHORTLY. HP WILL PROBABLY INTRODUCE A BASIC LANGUAGE PRODUCT SOON. XEROX HAS BEEN WORKING ON A TWO LINE PORTABLE LCD PRODUCT IN LINE WITH THEIR "STAR" AND "WORM". ALL THESE PRODUCTS CAN BE EXPECTED TO BE MORE POWERFUL WITH PLUG IN S/W, EXPANDABLE MEMORY AND FLEXIBLE I/O.

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ADVANCED LANGUAGE CALCULATOR

- 0 DETAILED DESIGN IS UNDERWAY FOR ONE LINE, 32 CHARACTER DISPLAY PRODUCT PENDING REVIEW OF THE MARKET RESEARCH DATA.
  
- 0 PRESENT FUNCTIONAL SPEC:
  - SIZE: 3¼" X 8" X 1"
  - KEYS: 60 INCLUDING NUMERIC PAD
  - DISPLAY: ONE LINE LCD, 32 CHARACTERS, 5 X 7 DOT MATRIX
  - MEMORY: 2K BYTES, EXPANDABLE TO 16K BYTES
  - LANGUAGE: BASIC BUILT IN (COMPARABLE TO 99/4 BASIC)
  - SOFTWARE: PLUG IN MODULE UP TO 32K BYTES
  - I/O: EIGHT LINE I/O BUS FOR FLEXIBLE EXPANSION
  - PRICE: \$200
  
- 0 THIS PRODUCT WAS EMPHASIZED TO OFFSET THE OVERALL EFFECT OF COMPETITIVE BASIC POCKET COMPUTERS ON OUR PROGRAMMABLE CALCULATOR BUSINESS.

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CALCULATOR PRODUCTS DIVISION  
OPERATING STRATEGY REVIEW  
ADVANCED LANGUAGE CALCULATOR COMPONENTS

PROCESSOR: TMS7120 (CMOS MLP) UNDER DEVELOPMENT IN TI JAPAN.  
LEADERSHIP 8 BIT PROCESSOR.

RAM: INDUSTRY STANDARD 2K X 8 CMOS STATIC RAM.

ROM: WILL BE ABLE TO SUPPORT THREE DIFFERENT TYPES OF ROM  
INTERNALLY AND IN PLUG IN MODULES.

- STANDARD CMOS ROM WITH MEDIUM ACCESS TIME (.5 MICROSEC).
- JAPANESE CMOS ROM WITH SLOW ACCESS TIME (3-6 MICROSEC).
- TI INTERNAL PROGRAM COUNTER ROM WITH 10 MICROSEC ACCESS TIME (PLANNED CMOS SPEECH ROM).

DISPLAY DRIVE: HITACHI LCD II CONTROLLER AND ONE DUMB DRIVER (2 CHIPS). TOSHIBA MAY BE A SECOND SOURCE FOR THE DUMB DRIVER.

GATE ARRAY: EIGHT VENDORS BEING SURVEYED NOW FOR THIS 300 GATE GATE ARRAY.

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CALCULATOR PRODUCTS DIVISION  
 OPERATING STRATEGY REVIEW  
 ADVANCED CALCULATOR MATERIAL/LABOR COSTS

MONTH	QTY	PRICE	4Q 81	1Q 82	2Q 82	3Q 82	4Q 82	1H 83	2H 83	YR 84
CPU-MLP	1.00	6.50				6.50	6.00	5.80	5.50	5.00
RAM 2K	1.00	9.00				9.00	8.00	8.00	7.50	7.00
SRAM 16	1.00	7.00				7.00	7.00	6.50	5.75	5.50
DECODE	1.00	5.50				5.50	5.50	5.00	4.50	4.00
LCD CON	1.00	7.00				7.00	7.00	6.50	5.50	4.50
LCD DRI	1.00	3.94				3.94	3.94	3.50	3.50	3.50
LCD	1.00	9.00				9.00	8.00	6.00	5.50	5.00
KEYBOARD	1.00	3.50				3.50	3.50	3.25	3.00	3.00
PCB	1.00	2.50				2.50	2.50	2.50	2.50	2.50
XTAL	1.00	0.80				0.80	0.80	0.80	0.80	0.80
XISTOR	1.00	0.10				0.10	0.10	0.10	0.10	0.10
DIODE	5.00	0.02				0.10	0.10	0.10	0.10	0.10
RES	15.00	0.01				0.15	0.15	0.15	0.15	0.15
CAP	4.00	0.05				0.20	0.20	0.20	0.20	0.20
PLASTIC	4.00	0.07				0.28	0.28	0.28	0.28	0.28
BATTERI	1.00	0.45				0.45	0.45	0.45	0.45	0.45
PIEZO	1.00	0.50				0.50	0.50	0.50	0.50	0.50
CONN	4.00	0.20				0.80	0.80	0.80	0.80	0.80
MECH	5.00	0.30				1.50	1.50	1.40	1.30	1.20
MISC	1.00	1.00				1.00	1.00	1.00	1.00	1.00
PACK	1.00	2.50				2.50	2.50	2.50	2.50	2.50
ADDER						0.31	0.30	0.28	0.26	0.24
USAGE						0.62	0.60	0.55	0.51	0.48
YEN FPV						0.96	0.91	0.83	0.76	0.69
TOT MAT						64.21	61.63	56.99	52.96	49.49
*										
LABOR H						1.60	1.20	1.03	0.92	0.81
LABOR R						5.10	5.20	5.50	5.80	6.50
LABOR\$						8.16	6.24	5.67	5.34	5.27

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**CALCULATOR PRODUCTS DIVISION**  
**OPERATING STRATEGY REVIEW**  
**ADVANCED LANGUAGE CALCULATOR COST INDEX**

MONTH	QTY	PRICE	4Q 81	1Q 82	2Q 82	3Q 82	4Q 82	1H 83	2H 83	YR 84
CAP TLG				39 167.00	180.00					
MOLD DE			7.80	39.64	67.71	54.17	43.34	69.34	41.60	62.40
CUM CAP			31.20	158.56	270.85	216.68	173.34	104.01	62.40	0.00
*										
APP OH						11.42	8.74	7.93	7.47	7.37
MOLD DE			7.80	39.64	67.71	108.34	3.94	1.73	0.52	0.31
TOT MOH			7.80	39.64	67.71	119.76	12.68	9.66	7.99	7.68
*										
WARRANT							0.90	19.80	72.00	144.00
STORE R						0.03	0.66	2.40	4.80	12.00
RMR SCR						0.22	4.75	15.96	29.66	64.39
RMR MAT						0.32	6.78	22.79	42.37	91.98
RMR RES										
FRT/DUT						0.64	13.56	45.59	84.73	183.96
PCC TOO			80.00	80.00	100.00	75.00				
TOT OOH			80.00	80.00	100.00	76.22	26.64	106.54	233.55	496.33
OOH/UNI			80.00	80.00	100.00	152.44	2.42	2.66	2.92	2.48
COST AD							1.23	1.14	1.06	0.92
PROD SU						37.90	9.26	8.37	7.73	6.86
*										
COB			87.80	119.64	167.71	382.48	93.46	84.49	77.99	69.20
*										
AUP						130	130	130	113.75	113.75
*										
GPM			-87.8	-119.6	-167.7	-126.2	401.96	1820.3	2860.8	8910.4
GPM %						-194.2	28.11	35.01	31.44	39.17
*										
RETAIL						200	200	200	175	175
RET GPM						35.00	35.00	35.00	35.00	35.00
*										
MRS					0.00	0.50	11.00	40.00	80.00	200
CUM MRS					0.00	0.50	11.50	51.50	131.5	331.5

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CALCULATOR PRODUCTS DIVISION  
OPERATING STRATEGY REVIEW  
ADVANCED LANGUAGE CALCULATOR SCHEDULE

0 A PERT SCHEDULE HAS BEEN DEVELOPED WITH THE FOLLOWING KEY MILESTONES.

CRITICAL COMPONENTS SPECIFIED	23 JUL 81
SECOND PASS S/W DESIGN	13 AUG 81
BREADBOARD COMPLETE	01 SEP 81
CRITICAL DESIGN REVIEW	07 OCT 81
MECHANICAL LAYOUT COMPLETE	14 OCT 81
7120 AVAILABLE	03 FEB 82
BASIC IMPLEMENTATION COMPLETE	03 FEB 82
MOLD DESIGN COMPLETE	10 MAR 82
ROM CODE RELEASE	07 APR 82
MOLDS COMPLETE	17 JUN 82
PREPRODUCTION COMPLETE	30 JUL 82
QUAL COMPLETE	04 OCT 82

0 MINIMUM SLACK BY FUNCTIONAL AREA

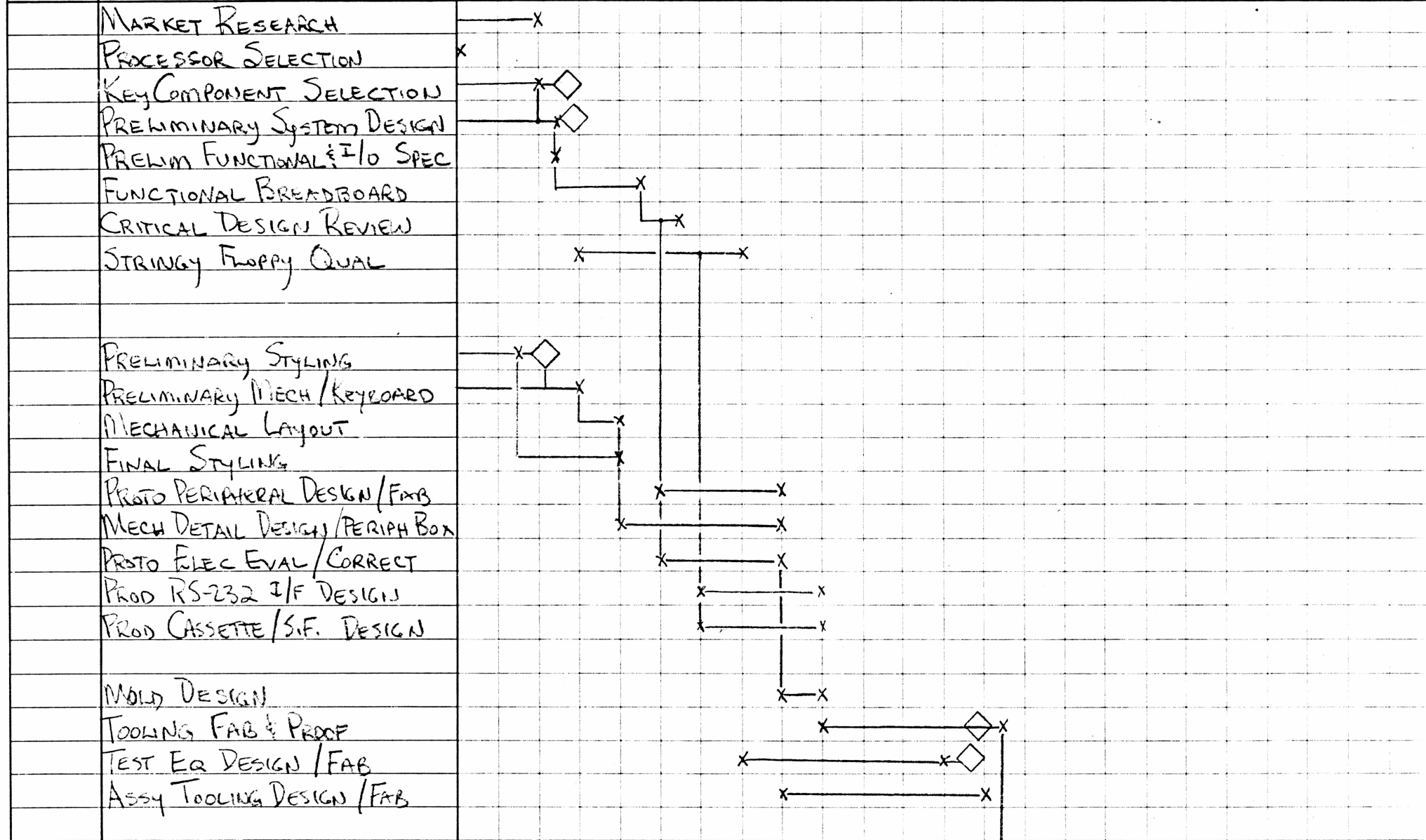
ASSEMBLY TOOLING	8 WEEKS
ELECTRICAL	0 WEEKS
MECHANICAL	2 WEEKS
SOFTWARE	0 WEEKS
TEST EQUIPMENT	5 WEEKS

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SCHEDULE CHART TI-13802-B	TEXAS INSTRUMENTS	PROGRAM	PROGRAM MANAGER	STATUS DATE
		ALC PRODUCT A	C. B. WILSON	6-17-81

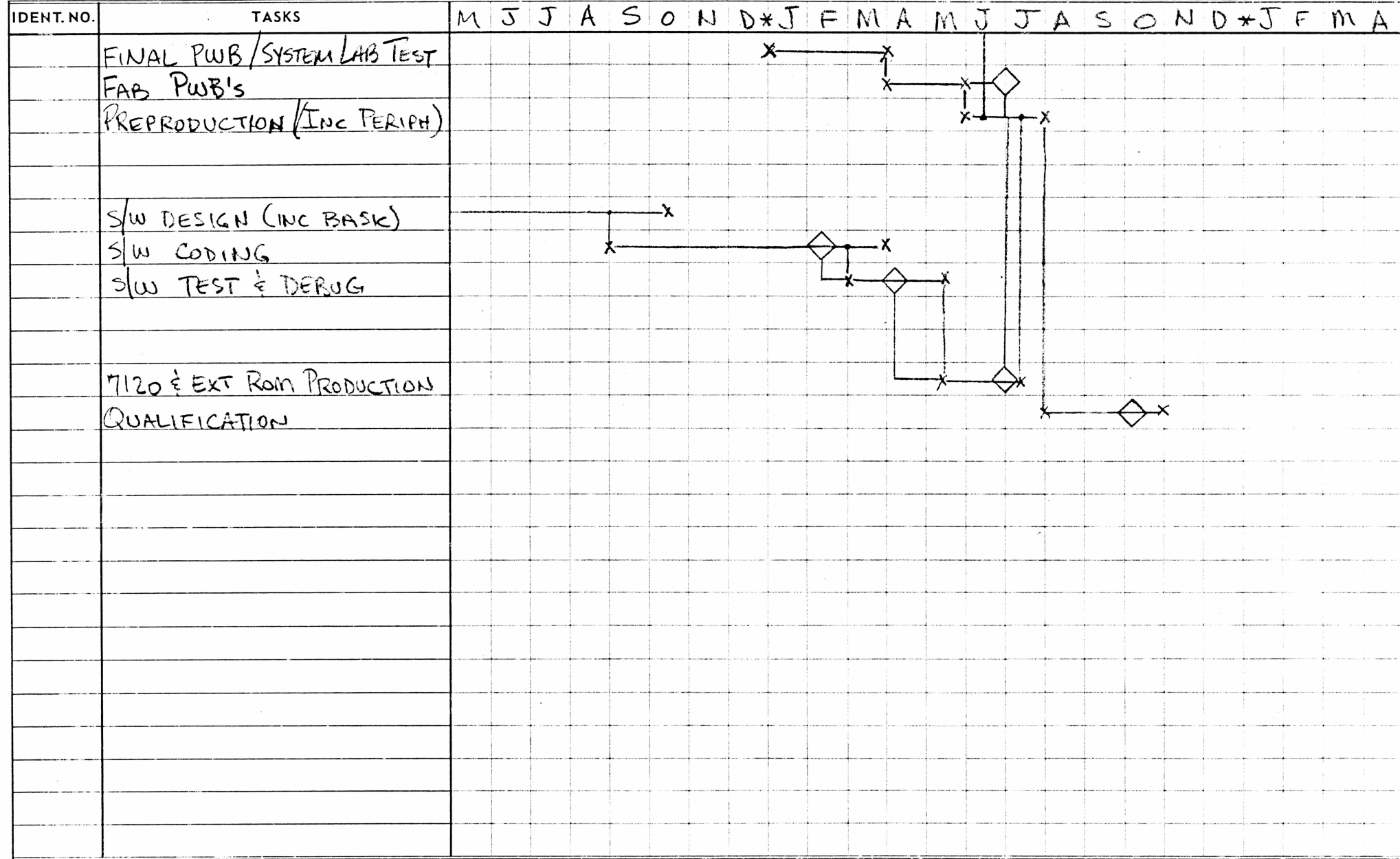
IDENT. NO.	TASKS	M J J A S O N D * J F M A M J J A S O N D * J F M A
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LEGEND: SCHEDULED EVENT COMPLETED EVENT REVISED SCHEDULE

4/30/81, CBW, 39-815

<b>SCHEDULE CHART</b> TI-13802-B	<b>TEXAS INSTRUMENTS</b>	<b>PROGRAM</b> ALC PRODUCT A	<b>PROGRAM MANAGER</b> C. B. WILSON	<b>STATUS DATE</b> 6-17-81
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LEGEND: ▽ SCHEDULED EVENT    ▼ COMPLETED EVENT    ◆ REVISED SCHEDULE

4/30/81, CBW, 39-815

CALCULATOR PRODUCTS DIVISION  
OPERATING STRATEGY REVIEW  
ADVANCED LANGUAGE CALCULATOR PROBLEMS/ACTIONS

0 PROBLEM: TMS 7120 DEVELOPMENT SCHEDULE

<u>MILESTONE</u>	<u>SCHEDULE</u>	<u>FORECAST</u>
TEST BAR EVAL	MARCH 1981	COMPLETE
LOGIC COMPLETE	MAY 1981	70% COMPLETE, COMPLETE IN JUNE
P.G. RELEASE	OCT 1981	DEC 1981
FIRST SLICES	DEC 1981	FEB 1982
DESIGN RELEASE	1Q 1982	MAR 1982

WE NEED TO BE ABLE TO RELEASE A GATE CODE FOR PROTOTYPE PRODUCTION IN EARLY FEBRUARY.

- 0 ACTION: FOCUS ATTENTION ON SCHEDULE THROUGH DIRECT CONTACT AND MICROPROCESSOR STRATEGY REVIEWS. DEVELOP CONTINGENCY PLAN FOR S/W SIMULATION WHICH WOULD ALLOW EARLY APRIL GATE CODE RELEASE WITHOUT SLIPPING PRODUCT INTRODUCTION.

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TI ALCC RESEARCH SAMPLE FULFILLMENT

CATEGORY OF INTERVIEW	STATUS: % INTERVIEWS COMPLETED				CUT OFF 6/10	FINAL QUOTA 100%
	5/22	5/30	6/2	6/3		
1. TECHNICAL/SCIENTIFIC	<u>49%</u>	<u>69%</u>	<u>74%</u>	<u>76%</u>	<u>85%</u>	<u>225</u>
- ENGINEERS	57	84	84	87	96	112
- SCIENTISTS	42	54	64	65	74	113
2. COLLEGE PROF/STUDENT	<u>67%</u>	<u>74%</u>	<u>79%</u>	<u>82%</u>	<u>93%</u>	<u>225</u>
- BUSINESS	68	75	78	83	98	113
- ENGINEERING	65	73	79	81	88	112
3. BUSINESS/FINANCE/ PROFESSIONAL	<u>53%</u>	<u>73%</u>	<u>79%</u>	<u>84%</u>	<u>95%</u>	<u>225</u>
4. MALL-ABOVE AVERAGE ADULT MALES	<u>96%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>100%</u>	<u>225</u>
TOTAL % COMPLETED	<u>66%</u>	<u>79%</u>	<u>83%</u>	<u>85%</u>	<u>93%*</u>	900
INTERVIEWS COMPLETED	<u>596</u>	<u>711</u>	<u>746</u>	<u>769</u>	<u>840*</u>	

\* 11 ADDITIONAL INTERVIEWS ARE COMPLETE IN THE FIELD, BUT NOT YET IDENTIFIED, BRINGING THE TOTAL TO 851 OR 95% OF THE 900 QUOTA.

6/11/81

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CRITICAL DESIGN REVIEW	07 OCT 81	✓
MECHANICAL LAYOUT COMPLETE	14 OCT 81	✓
7120 AVAILABLE	03 FEB 82	✓
BASIC IMPLEMENTATION COMPLETE	03 FEB 82	
MOLD DESIGN COMPLETE	10 MAR 82	✓
ROM CODE RELEASE	07 APR 82	6/11
MOLDS COMPLETE	17 JUN 82	6/24
PREPRODUCTION COMPLETE	30 JUL 82	
QUAL COMPLETE	04 OCT 82	

- 0 MINIMUM SLACK BY FUNCTIONAL AREA

ASSEMBLY TOOLING	8 WEEKS
ELECTRICAL	0 WEEKS
MECHANICAL	2 WEEKS
SOFTWARE	0 WEEKS
TEST EQUIPMENT	5 WEEKS

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UNIVERSAL PLANNING FORM

TOPS O/S PENDING GRID

	ALL RS232	TI ALC/99/4 GS.	TI 55-II	EPSON HC20	SHARP PC1500	HP 75/41	TI 99/4	PANASONIC RLH1000	SINCLAIR ZX80	Commodore VIC	SONY TYPECOVER	ATARI VHS	MATTEC INTELLIVISION	CASIO 702P
1		1		3	-	-		3	3					
2		1		-	-	-		-	-					
* 3		1		3?	-	-	3	3	-					
* 4		1		3?	-	-	X	-	X					
* 5		1		3?	-	-	3	-	-					
- 6		1		-	-	-		-	-					
7		1		-	-	-		-	-					
* 8		1		-	-	-		-	-					
- 9		1		-	-	-		-	3					
- 10		1		-	-	-	3	-	3					
11							4							
- 12		1		-	-	-	3	-	3					
13														
- 14		* 1		2	2	X	3		2	2	2			2
* 15			1	2	2	2		2	2	2	2			2
16			3											
17							4							
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32														
33														
34		X NO												
35		- COMES FOR ALC I/O CONV												
36		1 CAPTURE APPLS FOR TI												
37		2 PUT TI PRODS ON OTHERS												
38		3 CREATE NEW COMBINATIONS												
39		4 NEW TI INNOVATIONS												
40														
41														

APPL GAIN FOR TI: %PEN TO TI TAM VS DEV COST  
 GAIN IN TI PERIPH SAVES VS LOSS ON CONSOLES  
 %PEN TO OTHERS TAM VS DEV COST LESS LOSS ON CONSOLES

CONSUMER PRODUCTS GROUP  
LONESTAR DTC PLAN

	4Q82 <u>FCST</u>	4Q82 <u>DTC</u>	4Q83 <u>FCST</u>	4Q83 <u>DTC</u>	<u>PLAN TO CLOSE</u>
70C20 PROCESSOR	6.50	6.50	5.50	5.00	<u>VOLUME LEARNING</u> , OUTSIDE VOLUME <i>11.1.1.1.1.1.1.</i>
32K BYTE CMOS ROM	6.25	6.50	6.00	5.75	<u>INDUSTRY VOLUME</u> , THREE SOURCES
2K BYTE CMOS RAM	6.00	6.00	4.80	5.00	INDUSTRY VOLUME, FIVE SOURCES
LCD CONTROLLER/DRIVER	5.30	6.00	4.70	5.00	INDUSTRY VOLUME
LCD DUMB DRIVER	3.35	3.50	2.85	2.50	INDUSTRY VOLUME
GATE ARRAY	<u>8.00</u>	<u>7.00</u>	<u>2.80</u>	<u>2.75</u>	CONVERT TO CUSTOM DESIGN
TOTAL CMOS	35.40	35.50	26.65	26.00	
DISPLAY	7.20	7.00	6.00	6.00	DUAL SOURCE COST REDUCTION PROGRAM
PCB	12.80	12.80	9.00	9.00	MYLAR KEYBOARD CONTACT ELIMINATE GOLD
KEYBOARD	3.15	3.15	2.50	2.44	TWO CAVITY KEYPAD MOLD CONVERSION, ELASTOMER VOLUME
PLASTICS	4.76	4.50	4.07	3.76	VOLUME LEARNING AND ELIM. OF EMI COATING
ELECTIRCAL COMP	4.35	4.00	4.05	3.95	CHEAPER POTENTIOMETER
HWD,CONN. & SOCKETS	4.00	1.85	3.40	1.21	SIMP. MECH. DESIGN, QUAL. CHEAPER SOCKET
MANUALS, CASE & PACK	5.10	7.06	4.55	6.93	REDUCE CASE COST
MISCELLANEOUS	<u>.80</u>	<u>1.75</u>	<u>.59</u>	<u>1.20</u>	
TOTAL MATERIAL	77.56	77.31	60.81	60.49	
HPU	1.2	1.2	.80	.80	REDUCE ELEC COMP, SIMPLIFY MECH ASSEMBLY
LABOR + MOH	14.98	14.98	10.50	10.50	INCLUDE SELF TEST CODE
OOH + PS (10% AUP)	<u>21.46</u>	<u>21.46</u>	<u>16.76</u>	<u>16.76</u>	
TOTAL COST	114.00	113.75	88.07	87.75	
AUP	<u>162.50</u>	162.50	<u>146.25</u>	146.25	
GPM %	29.8	30	39.8	40	
SRP	<u>250.00</u>	250.00	<u>225.00</u>	225.00	

03-11-82 KPP 039-289

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